

ABSTRACT

A multi-step landing micro-mirror, a method for manufacturing the same, and a multi-step landing micro-mirror array are disclosed. The multi-step landing micro-mirror comprises a trench formed in a substrate and having $N-1$ steps in one side wall thereof; N plates rotated in or on the trench; and $2N$ springs for connecting the plates to each other; wherein the N plates are composed of an outermost first plate, a second plate connected with the first plate by the spring and located in the first plate, ..., and a N -th plate connected with a $(N-1)$ -th plate by the spring and located in the $(N-1)$ -th plate, wherein when voltages are applied to the N plates and the trench, respectively, the first plate is subjected to a first landing with a predetermined rotation angle on a first step of the trench due to the constant voltage, the second plate is subjected to a second landing with the predetermined rotation angle on a second step of the trench, ..., the N -th plate is subjected to a N -th landing with the predetermined rotation angle on the other side wall of the trench. Accordingly, the low voltage driving can be performed by performing the multi-step driving during the electrostatic force is applied, the elastic force of the spring for supporting the mirror can be enhanced, therefore the reliability of the optical switch can be improved.